

REMARKS

Claims 1 and 5 are cancelled; claims 2-4 and 8 are amended; and claims 2-4 and 8-16 are pending in the application. It is noted that claims 6 and 7 remain in the application as withdrawn claims. Claim 6 is amended to depend from claim 8, and claim 7 depends from claim 6. Applicant therefore requests allowance of claims 6 and 7 in the event that claim 8 (now generic to claims 6 and 7) is found allowable.

Claim 8, from which the remaining claims depend, recites a deposition apparatus which includes a substrate susceptor for receiving a semiconductor wafer substrate, and one or more lamps for providing radiant energy to the substrate. The claim further recites that at least one of the lamps has a reflector associated therewith, and that said reflector has a rugged reflective surface corresponding to a surface of a crumpled metallic foil. The claim further recites that two adjacent lamps provide radiant energy to the substrate, and that there is sufficient dispersion of energy from the lamps that at least 50% of the radiant energy impacting the substrate from one of the lamps is overlapped by radiant energy impacting the substrate from the other of the lamps.

Amended claim 8 corresponds to a combination of the originally-filed claim 8 with originally-filed claim 5. Claims 5 and 8 were rejected over Olsen (U.S. Patent 6,021,152), Lee (U.S. Patent 6,108,490) and Kulka (U.S. Patent 5,061,872). Applicant believes that amended claim 8 is allowable over the cited references.

The Examiner cites Olsen for showing a deposition apparatus utilizing a reflector to reflect radiant energy from a lamp toward a semiconductor wafer substrate. The Examiner recognizes that the reflectors of Olsen are not crumpled metallic foil, and thus cites Kulka

for showing a reflector corresponding to a crinkled metallic foil. Applicant notes, however, that Kulka pertains to a reflector for utilization in traffic signals and vehicle taillights, and contains no suggestion or disclosure that the reflector disclosed therein would have application to deposition apparatuses. Applicant further notes that the reflectors utilized in Olsen are polished metallic materials having relatively precisely milled stippling provided therein, (see, for example, column 6, line 55 through column 7, line 29 of Olsen). There is no suggestion or disclosure in Olsen that would lead one of ordinary skill in the art to believe that crumpled metallic foil could substitute for the reflectors disclosed in Olsen. Further, there is nothing that would lead one of ordinary skill in the art to look toward the non-analogous art field of traffic signals and vehicle taillights for reflector constructions that would be suitable to utilize in deposition apparatuses.

The Examiner contends that there would be motivation to utilize crumpled metallic foils of Kulka in Olsen “in order to disperse impinging light.” Such is a conclusion of the Examiner and is not supported by any teaching or suggestion within the cited references. Specifically, nothing in the references provides motivation to a person of ordinary skill in the art to substitute the crumpled metallic reflectors taught in Kulka for those of Olsen. The only teaching of utilization of crumpled metallic foils in deposition apparatuses is applicant’s specification. Accordingly, it would appear that the Examiner is improperly engaging in hindsight reconstruction of applicant’s invention, rather than demonstrating that motivation would have existed to a person of ordinary skill in the art to combine the teachings of Kulka and Olsen.

For at least the above-discussed reasons, claim 8 is allowable over the cited references.

The Examiner also recognizes that Olsen does not teach adjacent lamps providing overlapping radiant energy impacting a semiconductor substrate. Accordingly, the Examiner cites Lee for showing that it was known in the art to position a plurality of lamps to obtain some degree of overlap between the energy radiated from adjacent lamps to control temperature of a semiconductor substrate during deposition. Applicant respectfully submits, however, that there is no teaching amongst the cited references for utilizing rugged reflectors to obtain the claim 8 recited dispersion of energy from adjacent lamps. Specifically, as noted by the Examiner, Olsen does not teach utilization of a regular reflector to obtain dispersion of energy from adjacent lamps to achieve overlap of radiant energy from the lamps. Applicant notes that Lee discloses methodology for controlling an amount of overlap between adjacent beams by controlling how deep the adjacent bulbs are recessed within housing spaces. (See, for example, column 8, lines 36-43 of Lee.) Specifically, the amount of recessing of bulbs within housing spaces controls a degree of collimation of light emitted by the bulbs, which in turn controls the amount of overlap of beams from adjacent bulbs. Thus, Lee has a specific mechanism for controlling the amount of overlap of light from adjacent bulbs which does not utilize dispersion from rugged reflective surfaces adjacent to the bulbs.

The Examiner contends that it would be obvious to position the lamps of Olsen in appropriate locations so that overlap is created between the respective radiant energy that the lamps create in order to obtain temperature controllability as taught by Lee. Applicant

respectfully submits that neither Lee or Olsen teaches utilization of rugged reflective surfaces for obtaining the claim 8 recited dispersion of energy from adjacent lamps to achieve the claim 8 recited overlap of radiant energy. The only teaching of utilizing a rugged reflective surface to obtain dispersion of energy leading to overlap of radiant energy from adjacent lamps is applicant's specification. Neither Lee or Olsen suggests or teaches such a concept, and accordingly the Examiner is mistaken in concluding that a person of ordinary skill in the art could glean such concept from the cited references. As the only teaching of the claim 8 recited concept of utilization of a rugged reflective surface to obtain the recited dispersion of energy to lead to the recited overlap is within applicant's specification, it would appear that the Examiner is improperly engaging in hindsight reconstruction of applicant's invention, rather than demonstrating appropriate motivation within the cited references. For this additional reason, claim 8 is allowable over the cited references.

Claims 2-4 and 9-16 depend from claim 8 and are therefore allowable for at least the reasons discussed above regarding claim 8, as well as for their own recited features which are neither shown nor suggested by the cited references. Applicant notes that claims 10, 13 and 16 are rejected over Olsen and Lee, and further in view of Nishizawa (U.S. Patent 4,558,660). Applicant further notes that Nishizawa does not teach the features of claim 8 discussed above which were missing from the combined references of Olsen, Lee and Kulka. Accordingly, claim 8, and the claims depending therefrom, are allowable over any combination of the references of Olsen, Lee, Kulka and Nishizawa.

Claims 6 and 7 depend from claim 8. Applicant therefore respectfully requests that such withdrawn claims be allowed to issue in the event that amended claim 8 is found allowable.

Claims 2-4 and 6-16 are believed to be in condition for allowance for the reasons discussed above. Applicant therefore respectfully requests that the Examiner's next Action be a Notice of Allowance formally allowing all claims 2-4 and 6-16.

Respectfully submitted,

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By: 

David G. Latwesen, Ph.D.
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